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Peer Review Report

Peer review report 1 On "Modeling the Effects of Climate Change on Water, Sediment, and Nutrient Yields from the Maumee River Watershed"

Original Submission

Recommendation

Minor Revision

Comments to Author

The paper presents simulation results of stream flow and sediment loading from Maumee River watershed discharging to the Western Basin of Lake Erie under various future climate change scenarios. The modeling approach intended to capture the future precipitation characteristics by incorporating multiple realizations for daily precipitation derived from the stochastic weather generator. This approach could provide a probabilistic view of future impacts. The paper also examines the effects of conventional and no tillage practices on flow and sediment loading under the current and future climate scenarios. The results of this study provide additional insights about future potential impacts on sediments and nutrients discharges and their seasonal variations from Maumee River, which has significant contribution to recent algal blooms in Lake Erie. This topic would be interesting to readers of this journal. I recommend to accept it with some revisions as suggested in the following specific comments.

Specific comments:

1. General. In this study, authors intended to capture precipitation characteristics for the future scenarios and demonstrate resultant stream flow and sediment load in response to the precipitation characteristics. The followings might need to be clarified and/or improved:
   * Authors simply indicated that 100 realizations were generated from WXGEN in SAWT using monthly climate average values (lines 241-248) for each future scenario. It is not clear (1) what distribution was used to generate multiple realizations; (2) what are parameters of the selected distribution in addition to average/mean and how to estimate the parameters in this study; and (3) if there is any evaluation on historical precipitation distribution vs. future precipitation distribution.
   * The resultant sediment loading, which is an important measure of impact on nutrient discharge to and algal blooms in Lake Erie, is not well presented to inform its distribution characteristics corresponding to precipitation characteristics (such as Table 7). This might be improved by some type of box plot to maximize information on the results.
   * If authors intend to emphasize effects of precipitation characteristics on sediment loading, 100 iterations (or realizations) from the historical precipitation characteristics might be good for comparison with those from future climate scenarios.
2. Line 128, "Figure 3" instead of "Figure 2".
3. Lines 278-279, in addition to land use and soil types, creating HRUs also requires slope criteria. What slope categories were selected for the model? For the extremely low slope crop land, drain tiles are commonly used in the Midwest

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crop land, providing altered, direct conduits for flow and nutrients discharging to streams. Does the model include any considerations regarding drain tiles for the area?

4. Lines 396-397, change to "The summer months experienced a larger average reduction in flow (-38% to -45%) for high RCP scenarios (RCP 6 and RCP 8.5) than the mid-century model, ..."
5. Line 405, December-February instead of December-January.
6. Lines 453-455, change to ". . ..corresponding future scenarios using current tillage practice (Table 5)". Make the comparison more specific and clear to the readers.
7. Lines 455-463, Not clear about what is "the baseline scenario" specified here. If the "baseline scenario" means the historical case, the descriptions about decreased percentages are not consistent with Table 8.
8. Lines 464-467, Change to "current tillage practice" from "current watershed conditions". The paragraph is trying to compare results for 100% no-tillage (conservation tillage) practice with those for the current tillage practice under the same future scenarios. The decreased percentages described here cannot be easily found from Table 6 and Table 8. If they are averaged values for all 4 future scenarios, you may modify sentence to make it clearer. Suggest to combine Table 6 and Table 8 for easy comparison.
9. Lines 473-474, not clear that 16% lower is a comparison between 100% no-till and current tillage practices for historical case or for all future scenarios. If for the future scenarios, you may combine Table 6 and Table 8 together as suggested in comment 8. If it means for historical case, annual decrease is 18.8%. Change to "current tillage practice" from "current watershed conditions".
10. Lines 514-516, modify it as discussed in comment 9.

Anonymous

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